



PERMITTEE-RESPONSIBLE

MITIGATION ANALYSIS

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1.1 PURPOSE

The purpose of this report is to summarize the results of a mitigation analysis for the South Carolina Department of Transportation (SCDOT) I-526 West Corridor Improvements Project (herein, Lowcountry Corridor). Impacts to waters of the US are anticipated from the project. After efforts to avoid and minimize wetland and stream impacts are considered, SCDOT must mitigate for unavoidable impacts to these resources. This report builds upon a Mitigation Needs Assessment provided to SCDOT on August 16, 2019. Based on the outcome of the Mitigation Needs Assessment, HDR evaluated potential mitigation options for the I-526 project.

This draft report was prepared to provide a summary of site selection criteria and conservation priorities, potential site constraints, long-term management considerations, and proposed recommendations for the Conceptual Mitigation Plan. The results will be presented at an Agency Coordination Meeting (ACE) on December 11, 2019. Upon conclusion of the ACE meeting and field visits, the report will be updated with findings and a final recommendation will be made.

The information provided in this report is comprised of impact estimates, preliminary conceptual designs, and cursory reviews of potential mitigation alternatives. Due to its preliminary nature, this information is intended to be used for planning purposes only.

1.2 PROJECT BACKGROUND AND REGULATORY FRAMEWORK

The Project includes I-526 and the intersecting roadways of Rivers Avenue, I-26, International Boulevard, Montague Avenue, Dorchester Road, Leeds Avenue, and Glenn McConnell Parkway/Paul Cantrell Boulevard in Charleston County, South Carolina. The project is anticipated to result in impacts to Waters of the U.S. (WOUS) under the jurisdiction of the U.S. Army Corps of Engineers (USACE) as regulated by Section 10 and 404 of the Clean Water Act (CWA). Tidal marsh is also regulated as “Critical Area” by the South Carolina Department of Health and Environmental Control (SCDHEC) Office of Ocean and Coastal Resource Management (OCRM). Although two Project alternatives are currently under consideration, only one set of impact estimates is provided in this memorandum as the impact footprint is nearly identical for both alternatives. The major differences between the alternatives involve traffic distribution and 2- level versus 3-level interchange designs.

Anticipated WOUS and Critical Area impacts associated with the I-526 project are predominantly located in Hydrologic Unit Code (HUC) 03050201 Cooper River watershed and the Sea Islands/Coastal Marsh Level IV ecoregion.

1.3 REGULATORY BACKGROUND

As previously mentioned, impacts to WOUS are anticipated as a result of the proposed project. As such, compensatory mitigation will be required by USACE. Mitigation credit estimates outlined in this memorandum are based on the Charleston District USACE 2010 Compensatory Mitigation Guidelines.

Compensatory mitigation means the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved (33 CFR §332.2)

In 2008, EPA and the US Army Corps of Engineers jointly promulgated regulations revising and clarifying requirements regarding compensatory mitigation. Under the regulations, there are three mechanisms for providing compensatory mitigation, which are listed below in order of preference as established by the regulations:

1. mitigation banks
2. in-lieu fee programs
3. permittee-responsible mitigation (PRM)

This order is known as the mitigation hierarchy. South Carolina does not currently operate in-lieu fee programs; therefore, this analysis focuses on mitigation banks and PRM.

2.0 ESTIMATED WETLANDS AND WATERS IMPACT

This section summarizes the estimated impacts to waters of the U.S. associated with the Lowcountry Corridor project (Project) and provides the estimated mitigation credit need in accordance with the USACE Charleston District's 2010 "Guidelines for Preparing a Compensatory Mitigation Plan" (Guidelines). The memorandum also provides information regarding the availability of compensatory mitigation credits servicing the project area.

Tables 2-1 through 2-2 provide estimates of stream and wetland impacts and mitigation requirements for the Project. HDR used preliminary designs to estimate wetland and stream mitigation needs based on estimated impacts. Estimates are expected to decrease as designs are developed and finalized. The 25' drainage offset line was used to set the permanent impact boundary. In areas where a drainage line was not present, slope stake lines set the impact boundary. In areas lacking drainage and slope stake lines, proposed right of way or existing right of way was used to set the impact boundary. Temporary clearing impacts were assigned to wetlands and streams located between the permanent impact boundary line and the proposed right of way line to account for impacts related to installing erosion control measures. Shading impacts were assigned to streams and wetlands underneath proposed bridges. Clearing impacts were assigned to streams and wetlands located within the I-526/I-26 intersection because the majority of these resources could be temporarily impacted during construction of the flyovers.

Table 2-1 Required Wetland Mitigation Estimate

	Freshwater		Tidal		
	Permanent Fill	Clearing/NPDES	Permanent Fill	Clearing	Shading
Impact Area (acres)	18.76	30.37	2.71	5.93	17.32
Total	49.13		25.96		

Table 2-2 Required Stream Mitigation Estimate

	Freshwater	
	Pipe	Shade/Clear
Impact LF	6,441	5,997

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3.0 EXISTING AND PENDING MITIGATION BANKS

Information provided in this memorandum is comprised of information obtained from publically-available sources, including the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS), as of August 2, 2019. The project area was reviewed for mitigation banks currently servicing the project watershed. Table 3-1 summarizes the mitigation banks identified as having credits available to service the Project. Anticipated WOUS and Critical Area impacts associated with the Project are predominately located in Hydrologic Unit Code (HUC) 03050201 Cooper River watershed and Sea Islands/Coastal Marsh Level IV ecoregion. A small portion of the project south of Ashley River Road (SC 61) is located in HUC 03050202.

Table 3-1 Mitigation Bank Availability Summary

Mitigation Bank	Service Area	Available Credits			Notes/Status
		Freshwater Wetlands	Freshwater Streams	Critical Area Wetlands	
Approved Mitigation Banks					
Caton Creek Mitigation Bank	Primary	59	12,000	N/A	Bank Owned and Operated by HDR Inc.
Clydesdale Club	Tertiary	N/A	N/A	330	Past litigation & agency concern
Murray Hill	Tertiary	N/A	N/A	Unknown	Associated with Clydesdale Club Mitigation Bank
Palmetto Umbrella Mitigation Bank: Big Run Site	Primary	715	32,965	N/A	
Congaree Carton	Primary	1	N/A	0	Sold Out
Pigeon Pond	Secondary	0	N/A	N/A	Sold Out
SCDOT Huspa Creek – East Marsh Site	Primary	N/A	N/A	205	SCDOT owned bank
Swallow Savannah	Primary	0	N/A	N/A	Sold Out
Pending Mitigation Banks					
Brosnan Forest Coldwater Branch	Tertiary	Unknown	Unknown	N/A	Pending; Public Notice dated 1/2019
Caw Caw Swamp	Secondary	Unknown	Unknown	Unknown	Pending; Public Notice dated 1/2015
Daniel Island Mitigation Bank	Primary	N/A	N/A	Unknown	Pending; Public Notice dated 1/2017; SC Ports Authority is Sponsor
French Quarter Creek	Tertiary	Unknown	Unknown	N/A	Pending; Public Notice dated 2/2019

Mitigation Bank	Service Area	Available Credits			Notes/Status
		Freshwater Wetlands	Freshwater Streams	Critical Area Wetlands	
Halidon Hill	Primary	Unknown	Unknown	Unknown	Pending; Public Notice dated 8/2019
Robert F Haggerty – Jehossee Farm	Primary	Unknown	Unknown	Unknown	Pending; Public Notice 8/2019
Point Farm Salt Marsh Bank	Primary	N/A	N/A	Unknown	Pending; Public Notice dated 11/2018
Poplar Grove	Secondary	Unknown	N/A	N/A	Pending; Public Notice dated 12/2012
Swamp Thing	Tertiary	Unknown	Unknown	Unknown	Pending; Prospectus dated 4/2017

HDR used the landscape scale and watershed approach when identifying potential mitigation sites, by considering watershed priorities and existing protected properties. HDR also met with local conservation organizations and mitigation organizations to identify conservation priorities in the project area.

4.1 POTENTIAL MITIGATION SITES

HDR used GIS to analyze potential properties that could provide PRM for the project. Initial assessments of the search area were completed to identify potential PRM sites using a high-level evaluation of aquatic, terrestrial, recreational, cultural and historical resources. GIS data utilized in this screening process included the following:

- ∞ National Wetland Inventory (NWI) Mapping
- ∞ National Hydrography Dataset (NHD) Mapping
- ∞ United States Geological Survey (USGS) Quadrangles
- ∞ Aerial imagery
- ∞ Provided delineation or mitigation shapefiles

4.1.1 Cainhoy Plantation North

Cainhoy Plantation is a proposed mixed-use development on a 9,375 acre tract in Berkeley County, South Carolina. Approximately 4,547 acres of wetlands are located on the tract. The property is divided by Clements Ferry Road, and the northern portion of the property, or Cainhoy Plantation North, contains approximately 2,478 acres of wetlands and 97,409 linear feet of freshwater and tidal streams.

A public notice was issued by the USACE for the project on March 21, 2018. According to the public notice, approximately 187.9 acres of freshwater wetlands and 2.65 acres of tidal wetlands, or Critical Area, would be impacted by the project. The public notice includes an onsite PRM plan, which includes the creation of the 585-acre Point Hope Nature Sanctuary in Cainhoy Plantation North. The developer also proposes to preserve all remaining wetlands unimpacted by the project.

Cainhoy Plantation North was evaluated as a potential PRM site for the Lowcountry Corridor Project. Delineated wetland and stream boundaries were provided to HDR and were used to assess the site. Wetlands within the Point Hope Nature Sanctuary were estimated based on permit drawings within the USACE public notice.

Advantages:

- ∞ Approximately 752 acres of Salt Marsh/Critical Area wetlands are present onsite, with 26 acres suitable for restoration/enhancement.
- ∞ Approximately 1,736 acres of freshwater wetlands are present onsite.
- ∞ Federal and state agencies and conservation organizations have expressed interest in preservation of property.
- ∞ The permit application demonstrates threat of development.

- ∞ Proximity to federal protected lands owned by US Forest Service.

Constraints:

- ∞ Cost per acre is high because of development potential and would acquiring site may be cost prohibitive for SCDOT.
- ∞ The status of permit application is unknown.
- ∞ Acquiring property and preparing mitigation plan may exceed Lowcountry Corridor project schedule.
- ∞ Portions of site are not under threat as they are proposed as the Point Hope Nature Sanctuary, and may generate fewer credits. Site developer plans to preserve remaining wetlands which further minimizes threat.

4.1.2 Cedar Hill

Cedar Hill is the largest privately-owned plantation on the Cooper River in Berkeley County, South Carolina. Cedar Hill is 3,488 acres and unencumbered by conservation easements. Cedar Hill was evaluated as a potential PRM site for the Lowcountry Corridor Project. The parcel boundary was estimated based on Berkeley County GIS and NWI and NHD boundaries were used to assess the site for mitigation opportunities.

Advantages:

- ∞ 1,296 acres of wetlands and 62,447 linear feet of streams may be present on the site based on NWI and NHD boundaries.
- ∞ Federal and state agencies and conservation organizations have expressed interest in preservation of property.
- ∞ Proximity to federal protected lands owned by US Forest Service.

Constraints:

- ∞ Site is located outside of OCRM Critical Area. Freshwater marsh would be preserved, which is out-of-kind with proposed salt marsh/Critical Area impacts.
- ∞ Site does not meet the stream mitigation need.
- ∞ Property is listed as Under Contract.

4.1.3 Kings Grant

Kings Grant is an existing mitigation site located on the Ashley River in Dorchester County owned and operated by Open Space Institute. Portions of the former golf course are being restored into marsh as part PRM for other projects in the Cooper River watershed. The western portion of the site is the final phase of the project and was evaluated as a potential PRM site for the Lowcountry Corridor Project.

HDR used existing wetland boundaries and potential restoration areas provided by Open Space Institute to assess the site for mitigation opportunities. The site is located outside of OCRM Critical Area boundary and waters in this area are brackish. Credit generation may be reduced if the waters are determined to be freshwater instead of salt marsh/Critical Area.

Advantages:

- ∞ Site would contains 17 acres of existing wetlands which may be enhanced to meet Salt Marsh/Critical Area mitigation needs. Approximately 34 acres of the property could be restored to tidal wetlands based on initial elevation data (elevations less than 3.5 ft NAVD88, which were identified as areas that would be tidally flooded and potential restoration areas without grading).
- ∞ Adjacent lands have already been used as mitigation sites, so there is a precedence of mitigation activities in this area.

Constraints:

- ∞ Site does not meet the freshwater wetland mitigation need or produce stream mitigation.

4.1.4 Gippy Plantation

Gippy Plantation is an 800-acre property on the northwestern bank of the Cooper River located in between Fort Fairlawn and Lewisfield Plantation in Berkeley County, South Carolina. The property contains approximately 330 acres of historic rice fields and freshwater wetlands protected by a 330-acre conservation easement. Built in the 1850s, Gippy Plantation was identified as eligible for the National Register of Historic Places in 1971 for its mid-19th century architecture, and in a 1989 survey of historic resources in Berkeley County.

A residential development was proposed on Gippy Plantation, but in April 2019, the Town of Moncks Corner Planning Commission voted 4 to 2 to recommend denial to annex Gippy Plantation into the town and rezone the property to PUD. The developers subsequently decided to pull their annexation and zoning request instead of moving forward to Town Council.

Gippy Plantation was evaluated as a potential PRM site for the Lowcountry Corridor Project. NWI and NHD boundaries were used to estimate mitigation potential. A conservation easement boundary shapefile was provided to HDR.

Advantages:

- ∞ Site contains approximate 245 acres of freshwater wetlands outside of the conservation easement, with the potential for restoration, enhancement, and preservation.
- ∞ The site contains 12,466 linear feet of streams based on NHD layers, with the potential for preservation and enhancement.
- ∞ Conservation organizations have expressed interest in preservation of property.
- ∞ The recently denied permit application demonstrates threat of development.
- ∞ Proximity to protected lands at Lewisfield Plantation.

Constraints:

- ∞ Site does not meet the freshwater wetland or stream mitigation need. Salt marsh credits are not available at this site.
- ∞ A large portion of the site (330 acres) is not under threat as they are protected by a conservation easement as a result of an enforcement action.

4.1.5 Halidon Hill Mitigation Site

Halidon Hill Mitigation Bank was proposed by Halidon Hill Mitigation Bank, LLC in August 2019. SCDOT is considering use of the proposed bank as a PRM site. The proposed project consists of establishing a freshwater wetland and stream mitigation bank in the Cooper River watershed (8-digit Hydrologic Unit Code 03050201) located in the Level III Middle Atlantic Plains Ecoregion. Based on the public notice, the proposed 1,744.5-acre mitigation site includes approximately 1,074.6 acres of wetlands, 22.8 acres of non-wetland waters (or streams), and 647.1 acres of uplands. The proposal is to preserve 175.14 acres of freshwater wetland and 802 linear feet of stream. In addition, 222.93 of freshwater wetlands will be enhanced through removal of loblolly pine and replanted with native hardwood species. 94.36 acres of wetland will be enhanced through filling ditches, breaching/removal of berms, removal of roads and culverts, and installation of bridges or low flow crossings. 418.81 acres of wetland will be enhanced through removal of loblolly pine, replanting native species, and removing hydrological impairments. 16.91 acres of freshwater wetland will be restored by removal of loblolly pine and restoring natural hydrology. 21,881 linear feet of stream will be restored through removal of undersized culverts, bank stabilization, and construction of a new channel.

Advantages:

- ∞ 1,074.6 acres of freshwater wetlands and 22.8 acres of non-wetland waters are present on the site.
- ∞ SC Conservation Bank interest in preservation of site.

Constraints:

- ∞ Salt marsh credits are not available at this site.
- ∞ Portion of site under a conservation easement.

4.1.6 Fairlawn Expansion

Fairlawn Plantation is located near the Wando River, west of Awendaw, in Charleston County. In 2014, the Open Space Institute Land Trust Inc. and The Nature Conservancy purchased 2,241 acres as part of the Boeing facility mitigation. The property will be turned over to the U.S. Forest Service. The parcels evaluated include approximately 869 acres comprising of Tax Map Number 6250000040, 6250000087, and 6250000005 near Guerins Bridge Road and the Francis Marion National Forest. The parcels are also located adjacent to the existing Congaree Carton Mitigation Bank, which has produced freshwater and salt marsh/Critical Area mitigation credits.

Based on NWI and NHD mapping, the parcels contain approximately 95 acres of salt marsh/Critical Area, 362 acres of freshwater wetlands, and 8,800 linear feet of tidally-influenced streams.

Advantages:

- ∞ Proximity to federal protected lands and previous mitigation sites
- ∞ Site contains a variety of freshwater and salt marsh/Critical Area resources.

Constraints:

- ∞ Small size in total acres and preserved wetlands and ratios will be lower than other sites, which may mean it might not cover the impacts by itself. Would have to be combined with other sites.

- ∞ Greater distance to impact site compared to other sites

4.1.7 Daniel Island Mitigation Site

Daniel Island Mitigation Bank was proposed by the SC State Ports Authority in January 2017. SCDOT is considering use of the proposed bank as a PRM site. According to the public notice, the proposed project consists of establishing a saltwater mitigation bank in the Cooper River watershed (8-digit Hydrologic Unit Code 03050201) in the Sea Island/Coastal Marsh Ecoregion. The 135-acre mitigation site is a portion of a former confined disposal facility and prior to 1970 was used to manage dredged material. During the 1980s and 1990s, the majority of the mitigation site was plowed and planted with row crops on an annual basis. However, farming activities were discontinued more than 10 years ago. According to the Prospectus, the mitigation site consists of 25.67 acres of existing salt marsh and 109.09 acres that were used for the placement of dredged material and farming activities.

The proposed mitigation work plan consists of removing the existing vegetation and excavating 105.35 acres in order to create the elevations necessary to establish tidal creeks, low marsh, and high marsh on the mitigation site. Once the appropriate elevations are established, salt marsh vegetation would be planted within the low marsh and high marsh restoration areas and natural tidal flows would inundate the mitigation site twice daily.

Advantages:

- ∞ Over 130 acres of existing salt marsh and Salt marsh/Critical area restoration on the site.

Constraints:

- ∞ Freshwater wetland credits are not available at this site.
- ∞ Sediment testing for contaminants ongoing.
- ∞ Construction costs for earthwork are cost prohibitive.

4.1.8 Berkeley County Timber Sites

The Berkeley County Timber Sites include properties surrounding the existing Big Run Mitigation Site, which is part of the approved Palmetto State-wide Umbrella Mitigation Bank. The Berkeley County Timber Sites are approximately 15,805 acres owned by private timber management companies. The sites include freshwater wetlands and streams in the Cooper River watershed (8-digit Hydrologic Unit Code 03050201) in the Lower Coastal Plain Ecoregion. NWI and NHD boundaries were used to estimate mitigation potential. The site contains approximately 120,934 linear feet of streams and 2,545 acres of freshwater wetlands.

Advantages:

- ∞ Proximity to an existing mitigation bank and protected lands.
- ∞ Sites are located in headwaters of Ashley/Cooper watershed.

Constraints:

- ∞ Salt marsh/Critical Area credits are not available at this site.

4.1.9 James Island Dredge Island Restoration

Based on Google Earth mapping, an approximately 28-acre dredge disposal island is located on the James Island Connector in Charleston County near the SC 61 exit. USFWS recommended review of this site for mitigation opportunities. Based on aerial mapping, approximately 9 acres and 4 acres of salt marsh/Critical area could be restored and enhanced, respectively. Topographic survey of the dredge disposal and installation of tide gages would be necessary to refine restoration and enhancement areas.

Advantages:

- ∞ Agency interest in restoration of property.
- ∞ Salt marsh/Critical area credit generation.

Constraints:

- ∞ Freshwater wetland credits are not available at this site.
- ∞ Sediment testing for contaminants may be required as a former dredge disposal.
- ∞ Construction costs for earthwork may be cost prohibitive.

4.1.10 Jehossee Farm Mitigation Site

The Robert F. Hagerty Coastal Mitigation Bank – Jehossee Farm Mitigation Site was proposed as a mitigation bank in a public notice on August 26, 2019. SCDOT is considering use of the proposed bank as a PRM site. The Jehossee Farm Site is approximately 485 acres and would provide a total of 453.08 acres of estuarine emergent and palustrine forested wetlands. This total includes 266.38 acres of estuarine emergent wetland preservation, 28.16 acres of palustrine forested wetland preservation, 18.13 acres of estuarine emergent wetland restoration, 44.83 acres of estuarine emergent wetland enhancement, 5.20 acres of estuarine salt shrub thicket restoration, and 82.13 palustrine forested wetland restoration. In addition, the project will include 17.38 acres of Bird Management Area (BMA) preservation. Estuarine emergent wetland areas (i.e. coastal marsh) include tidal creeks and sub-tidal bottom habitats.

The Jehossee Farm Site is located on the hydrologic break between two watershed cataloging units: (1) South Edisto River – Atlantic Intracoastal Waterway (12-digit HUC 030502060308); and (2) Dawho River-North Edisto River (12-digit HUC 030502060405). The proposed primary service area extends to Charleston and would include the proposed I-526 Lowcountry Corridor project.

Advantages:

- ∞ Site includes freshwater and salt marsh/Critical Area wetlands.

Constraints:

- ∞ Mitigation Site is located outside of project watershed.
- ∞ Site does not include streams.

4.2 CONSERVATION AGENCY AND MUNICIPAL CORRESPONDENCE

Conservation agencies were contacted to determine if they have identified specific properties or high-interest areas that may be suitable as potential PRM sites or coastal restoration projects. The following is a summary of entities contacted and potential mitigation projects.

4.2.1 SC Department of Natural Resources (DNR)

One of DNR's priorities is to create living shorelines through oyster bed restoration projects and/or marsh plantings. SCDNR's South Carolina Oyster Recycling and Enhancement Program (SCORE) is a community-based habitat restoration and monitoring program. On October 21st, 2019 HDR held a conference call with several staff from DNR (Ben Dyar, Michael Hodges, Peter Kingsley-Smith, and Gary Sundin). Per DNR staff, there are ample locations within Charleston County in need of such work. The cost for such projects depends on the specific project's restoration goal and therefore the methods employed to accomplish the goal. The cost ranges are shown in Table 4-1. The shell bags and marsh plantings have a volunteer component to them adding to the community involvement and outreach and education.

Table 4-1 Oyster Bed Restoration Costs

Project Type/Method	Cost per Acre
Loose Shell Planting	\$150k-180k
Shell Bag Planting	\$225k
Marsh Planting	\$100k-150k

4.2.2 NOAA National Marine Fisheries Service

On October 17th HDR spoke with Cyndi Cooksey with NOAA's Habitat Conservation Division concerning their priority areas. NOAA has an interest in improving Filbin Creek, which is a tributary into the Cooper River that runs along Interstate 526 within the Project area. There are opportunities to improve tidal connectivity and overall water quality in Filbin Creek.

4.2.3 City of Charleston

The City of Charleston recently published their Final Report associated with the Dutch Dialogues. In reviewing the report, the City of Charleston is looking at opportunities to expand the Newmarket Creek watershed to improve drainage, water storage potential, and environmental quality. Specifically it was suggested that Newmarket Creek is daylighted and that the intertidal zone under Septima Clark should be improved to manage tidal impacts.

4.2.4 City of North Charleston

Over the years the City of North Charleston has focused on revitalizing the southern end of the city which includes Noisette Creek. The Noisette Community Master Plan includes recommendations for restoring natural systems in the focus area. As outlined in the plan, there are ample opportunities to restore Noisette Creek as well as portions of Filbin Creek. In 2009, the City of North Charleston applied for a grant to fund the 'Restoring Wetlands in Noisette Creek' project. This project identified 8 restoration areas (Figure 11 in Appendix A). The project would result in the restoration of 9.5 acres of wetlands and 2,400 feet of restored creek channel. The overarching goal of the project is to enhance and restore the Noisette Creek watershed.

4.2.5 SCDOT Invasive Species Control

Phragmites australis is a non-native reed that can crowd out native vegetation in marsh or estuary habitats. *Phragmites* management has occurred on Filbin Creek in the past. As a potential mitigation measure, SCDOT would fund *Phragmites* management for up to 3,500 acres of wetlands and marsh.

Herbicide applications may occur using aerial, aquatic and land-based equipment and may be considered when environmental factors, such as large spray areas, topography and site access, may hinder the ability to spray target plant species. Both airplanes and helicopters have been used traditionally for aerial herbicide applications. Implementation of drone aerial herbicide applications can also be used for targeted spraying. Vegetation monitoring methods typically include direct stem counts or percent aerial cover estimates for established vegetation plots in terrestrial environments. Access to these plots is often challenging because of their remote location, topography, dense vegetation or environmental factors, such as the presence of sensitive communities.

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Table 5-1 provides a summary of the sites identified for potential PRM. Mitigation estimates, advantages and constraints were identified based on GIS mapping, professional judgment, and readily available data sources. Field verification of jurisdictional resources will reveal discrepancies when compared with data depicted within this document. In addition to the sites identified, SCDOT will continue to consider contributions to the SCDNR SCORE program as well as other conservation and municipal restoration initiatives.

Constraints associated with Cainhoy Plantation North, Gippy Plantation, Daniel Island Mitigation Bank, James Island Dredge Island would limit the potential for these sites to provide mitigation within the project schedule and budget. Based on the initial analysis, a combination of mitigation sites may be necessary to meeting mitigation needs for the project. Cedar Hill and Kings Grant sites have the potential to meet freshwater and tidal mitigation needs of this project and are within the watershed. HDR recommends an on-the-ground reconnaissance of these sites in an effort to determine accurate existing conditions of its resources. An evaluation of on-site conditions will allow for a more accurate determination of potential credit generation and identification of potential fatal flaws that may render a site unusable. Additionally, discussions with landowners will provide SCDOT an opportunity to discern their interests in selling property (or an easement on the property), which is a critical step in determining each site's feasibility to provide anticipated mitigation needs.

If constraints are identified for Cedar Hill and Kings Grant, other sites identified in this report have the ability to meet project mitigation needs, including Halidon Hill Mitigation Site, Fairlawn Expansion, Berkeley County Timber Sites, and Jehossee Farm Mitigation Site. Discussion during the December 11, 2019 Agency Coordination Effort meeting will be documented and appended to this report.

Table 5-1 PRM Site Summary

Site Name	County	Site Acreage	Freshwater Streams (LF)	Estimated Salt Marsh/Critical (AC)	Estimated Freshwater Wetland (AC)	Advantages	Disadvantages
Cainhoy Plantation	Berkeley	5,703	65,110	752	1,736	<ul style="list-style-type: none"> Agency and conservation organizations interest. Threat of development. Proximity to federal protected lands. 	<ul style="list-style-type: none"> High cost per acre. Unknown permit application status. Project schedule. Portions of site are not under threat.
Cedar Hill	Berkeley	3,528	62,447	0	1,296	<ul style="list-style-type: none"> Agency and conservation organizations interest. Proximity to federal protected lands. 	<ul style="list-style-type: none"> Site is located outside of OCRM Critical Area Site does not meet the stream mitigation need. Property is Under Contract.
Kings Grant	Dorchester	104	0	51 ¹	0	<ul style="list-style-type: none"> Precedence of mitigation activities in this area. 	<ul style="list-style-type: none"> Site does not meet the freshwater wetland mitigation need or produce stream mitigation.
Gippy Plantation	Berkeley	332	12,466	0	245	<ul style="list-style-type: none"> Conservation organization interest of property. Threat of development. Proximity to protected lands at Lewisfield Plantation. 	<ul style="list-style-type: none"> Site does not meet the freshwater wetland or stream mitigation need. Salt marsh credits are not available at this site. 330 acres is already protected by a conservation easement.
Halidon Hill	Berkeley	1,745	23	0	1,075	<ul style="list-style-type: none"> SC Conservation Bank interest in preservation of site. 	<ul style="list-style-type: none"> Salt marsh credits are not available at this site. Portion of site under a conservation easement.

Site Name	County	Site Acreage	Freshwater Streams (LF)	Estimated Salt Marsh/Critical (AC)	Estimated Freshwater Wetland (AC)	Advantages	Disadvantages
Fairlawn Expansion	Charleston	869	0	95	362	<ul style="list-style-type: none"> Proximity to federal protected lands and previous mitigation sites. Site contains a variety of freshwater and salt marsh/Critical Area resources. 	<ul style="list-style-type: none"> Small size in total acres and preserved wetlands. Would have to be combined with other sites. Greater distance to impact site compared to other sites.
Daniel Island	Berkeley	135	0	130	0	<ul style="list-style-type: none"> Freshwater wetland credits are not available at this site. 	<ul style="list-style-type: none"> Freshwater wetland credits are not available at this site. Sediment testing ongoing. High construction costs.
Berkeley County Timber	Berkeley	15,805	120,934	0	2,545	<ul style="list-style-type: none"> Proximity to an existing mitigation bank and protected lands. Sites are located in headwaters of Ashley/Cooper watershed. 	<ul style="list-style-type: none"> Salt marsh/Critical Area credits are not available at this site.
James Island Dredge	Charleston	28	0	13	0	<ul style="list-style-type: none"> Agency interest in restoration of property. Salt marsh/Critical area credit generation. 	<ul style="list-style-type: none"> Freshwater wetland credits are not available at this site. Sediment testing for contaminants may be required. High construction costs.
Jehossee Farm Mitigation Site	Charleston	485	0	335	128	<ul style="list-style-type: none"> Site includes freshwater and salt marsh/Critical Area wetlands. 	<ul style="list-style-type: none"> Mitigation Site is located outside of project watershed. Site does not include streams.

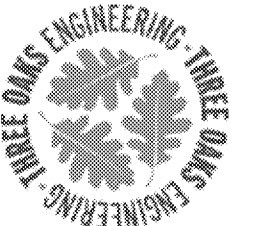
1 Site is located outside of OCRM Critical Area, but mitigation would enhance and restore tidal brackish wetlands.

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APPENDIX A FIGURES

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Prepared For:



**I-526 LOWCOUNTRY
CORRIDOR MITIGATION
ANALYSIS**

Cainhoy Plantation North

Berkeley County, SC

Date: 11/18/2019

Scale: 1:30,000

Job No.: 10045819

Drawn By: rd

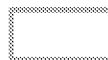
Checked By: ek

Mitigation Analysis

1




Legend




 Cedar Hill Plantation
Approx Boundary = 3,528
AC

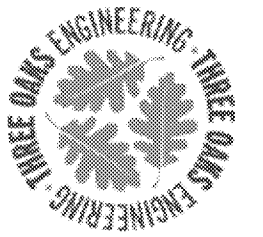
**Potential Stream
Mitigation**

 Preservation

 Restoration

**Cedar Hill Plantation
Approximate Wetlands**

-  Freshwater Marsh,
Preservation
-  Freshwater Wetland,
Preservation
-  Freshwater Wetland,
Restoration



Prepared For:



**I-526 LOWCOUNTRY
CORRIDOR MITIGATION
ANALYSIS**

Cedar Hill Plantation

Berkeley County, SC

Date: 11/18/2019

Scale: 1:30,000

Job No.: 10045819

Drawn By: rd	Checked By: ek
-----------------	-------------------

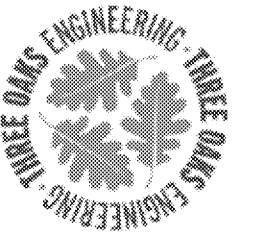
Mitigation Analysis

2



Legend

- Kings Grant Site = 104 AC
- Tidal Wetland Enhancement
- Tidal Wetland Restoration



Prepared For:

SCDOT

FHWA

I-526 LOWCOUNTRY CORRIDOR MITIGATION ANALYSIS

Kings Grant Mitigation Site

Dorchester County, SC

Date: 11/18/2019

Scale: 1:4,000

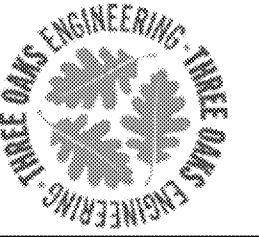
Job No.: 10045819

Drawn By:
rd

Checked By:
ek

Mitigation Analysis

3



Prepared For:



**I-526 LOWCOUNTRY
CORRIDOR MITIGATION
ANALYSIS**

Gippy Plantation

Berkeley County, SC

Date: 11/18/2019

Scale: 1:10,000

Job No.: 10045819

Drawn By: rd

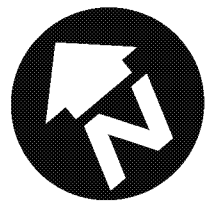
Checked By: ek

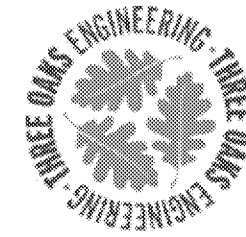
Mitigation Analysis

4



Figure 5: Mitigation Unit Map





Prepared For:



I-526 LOWCOUNTRY CORRIDOR MITIGATION ANALYSIS

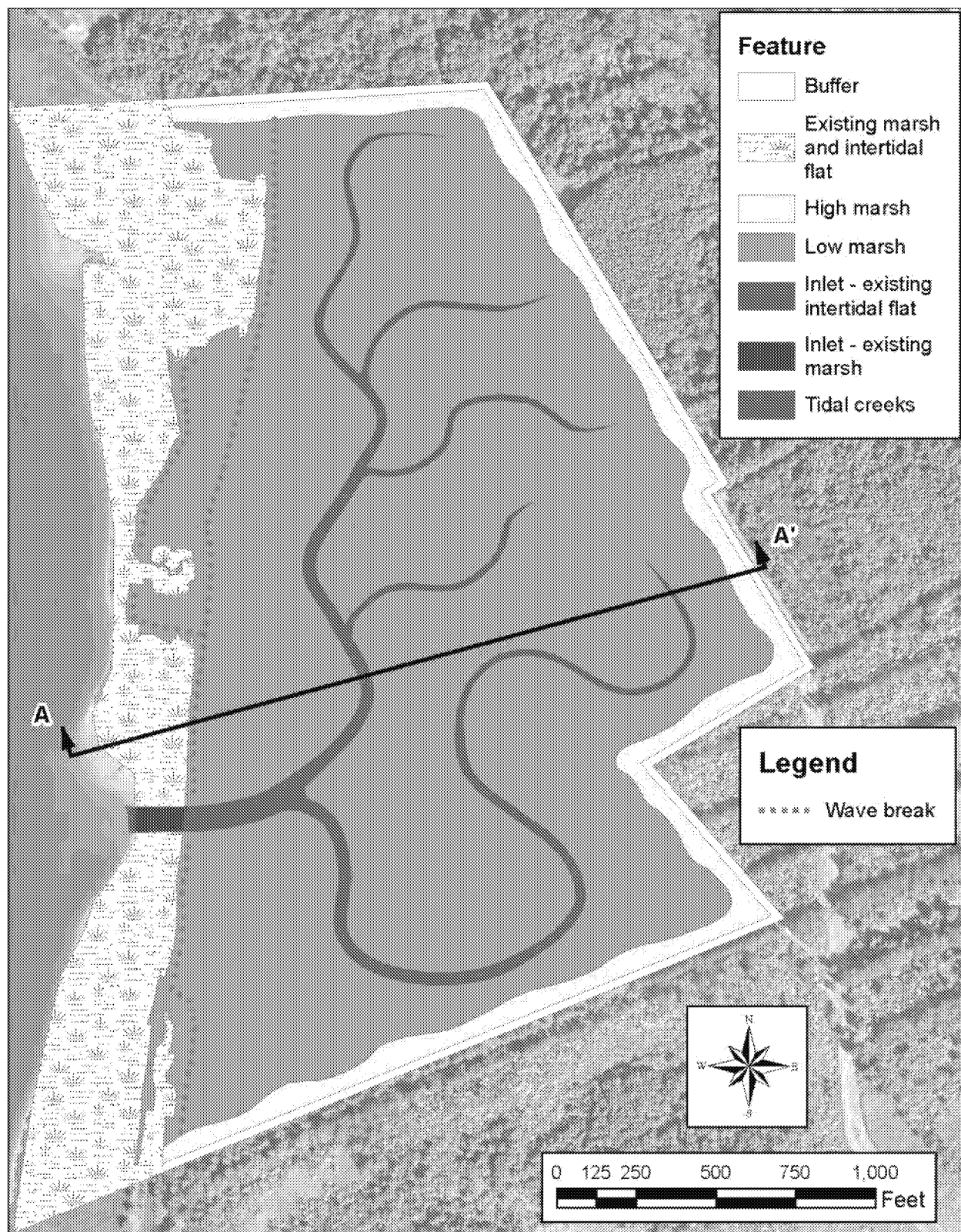
Fairlawn Expansion

Charleston County, SC

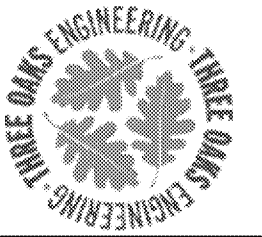
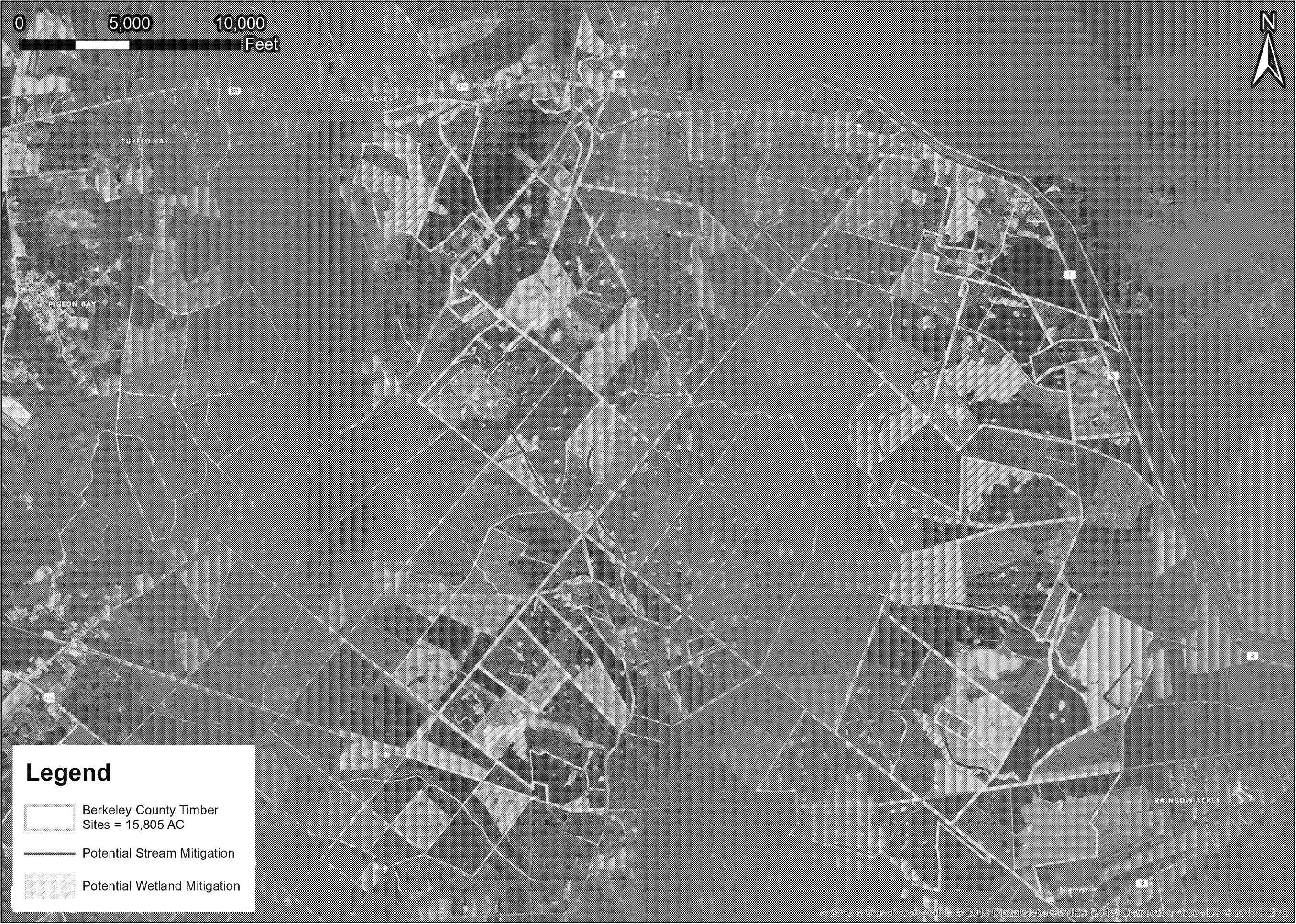
Date:	11/18/2019
Scale:	1:12,000
Job No.:	10045819
Drawn By:	Checked By:
gm	ek

Mitigation Analysis

6



Daniel Island Mitigation Bank
Figure 7: Mitigation Unit Map



Prepared For:



**I-526 LOWCOUNTRY
CORRIDOR MITIGATION
ANALYSIS**

Berkeley County Timber Sites

Berkeley County, SC

Date: 11/18/2019

Scale: 1:50,000

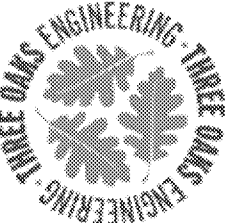
Job No.: 10045819

Drawn By: gm

Checked By: ek

Mitigation Analysis

8



Prepared For:



I-526 LOWCOUNTRY CORRIDOR MITIGATION ANALYSIS

James Island
Dredge Island Restoration

Charleston County, SC

Date: 11/18/2019

Scale: 1:2,500

Job No.: 10045819

Drawn By:
gm

Checked By:
ek

Mitigation Analysis

9

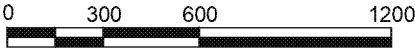


Mitigation Unit by Type and Quantity				
Map ID	Mitigation Unit	Resource Type	Mitigation Type	Quantity
	W-1	Coastal Marsh	Restoration	(~ 18.29 ac.)
	W-2	Coastal Marsh	Enhancement	(~ 44.83 ac.)
	W-3	Coastal Marsh	Preservation	(~ 86.61 ac.)
	W-4	Salt Shrub Thicket	Restoration	(~ 5.20 ac.)
	W-5	Estuarine Fringe Forest	Restoration	(~ 28.93 ac.)
	W-6	Estuarine Fringe Forest	Preservation	(~ 28.16 ac.)
	W-7	Pine Flatwoods	Restoration	(~ 82.13 ac.)
	W-8	Bird Management Area	Preservation	(~17.38 ac.)
	U-9	Upland Buffer	Preservation	(~9.85 a.c.)

Legend		
Boundary	(~ 473.17 ac.)	
Outparcels	(~6.02 ac.)	
Dike Removal (Bridge Span)		
Access Easement	(~4.22)	

- NOTES:
1. This is not a survey.
 2. Area calculations are approximate.
 3. Aerial photograph from USGS high resolution orthoimagery dated 2012.

Figure 10: Jehossee Farm Mitigation Site



L:\WETLANDS\2019 WETLANDS FILES\LMG19.021 --- Jehossee Mitigation Bank, Vince Messerly\CAD\Jehossee.dwg

 LAND MANAGEMENT GROUP a DAME & MOHR company 3805 Wrightsville Ave, Suite 15 Wilmington, North Carolina 28402 Telephone: 910-452-0001	Project: Jehossee Farm Charleston County, SC	Date: 4/3/19	Revision Date: NA
	Title: Mitigation Layout	Scale: 1"=600'	Job Number: LMG19.021
		Drawn By: GSF	Figure: 4



SHEET 2 OF 10

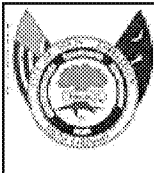
HLA INC

**NAVY
YARD**
AT NOISSETTE

**SOUTHERN
CONSTRUCTION
SERVICES INC**

RESTORING WETLANDS IN NOISETTE CREEK RESTORATION AREA LOCATION EXHIBIT CITY OF NORTH CHARLESTON, SOUTH CAROLINA

michaux conservancy
Preserving the Land We Love



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www.hlainc.com
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fax 843.763.1909

City of North Charleston
P.O. Box 190016, North Charleston, SC 29419
tel 843.740.2588
www.northcharleston.org

Figure 11: Noiset Creek Restoration Area

1031 Chuck Dawley Blvd., Ste 7A-1, Mt. Pleasant, SC, 29464
www.allenenv.com
tel 843.793.9887
fax 843.849.0508